

NOTES AND EXTRACTS.

THE MILD WEATHER OF DECEMBER, 1905.

Several cooperative observers have called attention to the unusual mildness of the month of December, 1905. Thus Mr. Frank S. Jennison, who has kept a record for thirty years in Bangor, Me., reports the following figures as the average temperatures for the month of December for the last thirteen years.

Year.	6 a. m.	Noon.	6 p. m.	Mean.
	° F.	° F.	° F.	° F.
1893.....	12	21	16	16
1894.....	16	23	18	19
1895.....	16	28	22	22
1896.....	15	22	18	18
1897.....	16	30	16	21
1898.....	10	20	15	15
1899.....	20	32	22	25
1900.....	11	20	12	14
1901.....	11	21	13	15
1902.....	9	19	13	14
1903.....	11	21	13	15
1904.....	3	12	9	8
1905.....	16	30	23	23

The above-given mean of the three observations is probably a little higher than the true daily mean, but the comparison of successive years will not be affected thereby, so that December, 1899, must have been warmer than December, 1905.

The well-known observer and historian, Miss Ellen D. Larned, of Thompson, Windham County, Conn., writes as follows:

The mean temperature for 1904 footed up the lowest since my own or Doctor Caswell's observations began. The mild December of 1905 brought the mean annual temperature for that year nearly up to the average, viz: 45.56; the mean for 55 years is 46.

The twelve days of Christmas season December 25, 1905, to January 5, 1906, recalled the similar fine weather of 1829-30 for which I give the following record from the Larned diary, viz:

Saturday, December 25.—Dark morning. Sun comes out early. Fair and bright.

26.—Weather still fine.

27.—Weather still fine and warm. Cloudy and rainy evening.

28.—Dark morning. Sun came out warm as summer. Continued fine all day.

29.—Weather continues fine.

30.—Weather still warm and summer-like.

31.—Threatening morning. Cleared before noon. Another fine day.

1830. January 1.—Rather cooler but a most beautiful New Year's Day.

2.—Light snow in the night. Cleared soon. Another day as fine as the preceding.

3.—Fine, cloudless day. Nothing ever like it before.

4.—Another fine day.

5.—Cold and somewhat cloudy. Twelfth day of Christmas, all fine.

METEOROLOGY IN INDIA.

We venture to publish the following interesting items, mentioned in a letter of November 28, 1905, from Mr. Gilbert T. Walker, the Director of the Meteorological Service of India, to the Chief of the Weather Bureau:

Formerly it was necessary in a place like Lahore, Agra, Delhi, Karachi, or Rangoon to wait until 24 hours after the day's report and forecast were issued at Simla before the reports appeared in the papers; Calcutta, Bombay, and Madras each had a local office issuing a daily weather report. Now there is a daily telegram sent from Simla at 12:15 which goes "urgent" to most of the large cities and is posted up at the telegraph office.

There have also been large changes in consequence of the appointment of two Cambridge men (J. H. Field and J. Patterson) as assistants; they are both good experimental physicists. The former does the kite and balloon work and is attempting to follow in the footsteps of Professor Marvin in devising improvements in our instrumental equipment, while the latter is responsible for the daily weather work, the storm warnings, and the initiation of observations of solar radiation and atmospheric electricity.

We also have erected a splendid Japanese seismograph of the Omori-Ewing pattern, which is a great improvement on any that I have seen.

Field made a most successful beginning at Karachi¹ with kites. He had only a handgear (with some improvements for taking in slack wire) and got up through the monsoon winds into the calmer air above, which was not in sufficiently rapid movement to lift a kite far. He had not a breakaway or any appreciable accident in his seventeen flights, and promises to do extremely good work.

Balloons have very little chance of being found and returned in India. But as we want chiefly the direction and velocity of the currents at different heights, especially at considerable elevations, we have started at Simla² by observing with theodolites free balloons of gutta-percha tissue (which is much cheaper than India rubber here). We have experimented about five times, and usually get observations up to 25,000 feet above sea level; we hope to get up to about 33,000 feet shortly, but as the winds at that height are of about 35 to 45 miles an hour, the paper screen which is suspended from the balloon for purposes of visibility gets very hard to see after the balloon has been in the air for an hour, owing to the distance.

My personal investigations have been chiefly in connection with monsoon forecasting. I am sure to be badly wrong sometime, but hitherto I have been more successful than I expected to be. Of my three forecasts last year and four this year, six have been right and one neither right nor wrong in the general character of the results, although in details improvements are very much needed.

The chief thing that has impressed itself on my mind has been the need of a satisfactory collation of facts, for they often run counter to the most natural preconceived view. For example, high pressure at Mauritius and good gradients thence to India are extremely bad for monsoon rainfall. I gave the figures in the Annual Summary for 1903 (concluding chapter),³ and subsequent study has confirmed the view. Again high pressure in Siberia is favorable instead of unfavorable for the monsoon rains.

It seems to me, therefore, that for some time progress will lie in ascertaining what actually are the results of definite abnormalities of meteorological elements, and that it is not until more is known of them that it will be much good theorizing. Of course we must attempt to interpret each new fact in terms of what we know already, but it is not always easy to prove that the interpretation is correct as so little has been done in the way of recording the upper currents. One of the most interesting relationships is that of heavy snowfall in the Himalayas with increased ascensional movement at the equator on the south side. This year at the beginning of May the snowfall was the largest on record, so I telegraphed to Zanzibar and Seychelles for their April rainfall and found the former to be, as I had hoped it would be, the largest on record.

I find, however, that the winter snowfall is very hard to make much progress with. It seems to be related with the sun-spot data to some extent, in that heavy snow falls both at maxima and minima, as pointed out by Bradford. I have just noticed that here, as Woeikoff pointed out for Europe, the odd years tend to have more snow and rain than the even years; the average of the odd years is very materially larger than for the even ones.

¹ On the coast at latitude 25° north, longitude 67° east.

² Elevation 7000 feet; latitude 31° north, longitude 77° east.

³ By referring to the India Weather Review, Annual Summary, we find that the concluding summary occupies pages 649-661 and contains a résumé of the weather of the year, subdivided into: I. The cold weather period, January and February, 1903; II. Hot weather period, March to May, 1903; III. The southwest monsoon period, June to September, 1903; IV. Period of retreating southwest monsoon, October to December, 1903; and V. The year. Comparisons are made with previous years and in subdivision III the relations are discussed between rainfall and pressure gradients above referred to by Mr. Walker. The following deductions are made by him:

"The correspondence between rainfall and either the pressure gradients or the wind velocities at the Seychelles is not very clear. * * * The data for Mauritius yield the remarkable fact that the average pressure during the Indian monsoon period is lower in years of abundant rainfall than in years of scanty rainfall in India. The differences between the good and bad years are for June, .013 inch; July, .046 inch; August, .024 inch, and September, .018 inch.

"For Zanzibar the average pressure in the good years is lower than in the bad years by the following figures: June, .009 inch; July, .010 inch; August, .006 inch; and September, .035 inch. For the Seychelles the same result is true, the difference being—June, .019 inch; July, .039 inch; August, .013 inch; and September, .037 inch.

"The corresponding mean pressure in all India in the good years has a lower average than in the bad years by—June .008 inch, July .003 inch, August .002 inch, and September .029 inch. Thus the pressure difference between Mauritius and India, which might be regarded as measuring the force impelling the monsoon currents is less for the good years than the bad years by the following quantities: June, —.005 inch; July, —.043 inch; August, —.022 inch; and September, +.011 inch."